

WHAT IS CLAIMED IS:

1. A method for providing media defect management, said method comprising the steps of:

providing a user area parameter defining a user data area on the media; and

providing a replacement area parameter defining a user data replacement area on the media, wherein the user data replacement area on the media defined by the replacement area parameter may be null, and wherein the user area parameter and replacement area parameter are selectable to allow for optimization of defect management for a particular use of the media irrespective of physical attributes of the media.

2. The method of claim 1, further comprising the step of:

maintaining a defect list including information identifying each independently accessible section of user data replacement area on the media.

3. The method of claim 2, wherein the step of maintaining the defect list includes the step of:

categorizing the independently accessible sections of the user data replacement area in the defect list to provide information with respect to their use in replacing sections of user data areas of the media.

4. The method of claim 3, wherein the information provided by the categorizing step includes information with respect to a defective section of the user data area that has not been recorded within a section of the user data replacement area.

5. The method of claim 3, wherein the information provided by the categorizing step prevents chaining of a section of the user data area to multiple sections of the user data replacement area when a section of the user data replacement area becomes defective.

5           6.       The method of claim 1, wherein the user area parameter and the replacement area parameter combined define a logical zone such that, if the user area parameter and the replacement area parameter are selected to be sufficiently small with respect to a total size of the media, a plurality of equal in size zones of user data area and user data replacement area are defined on the media.

7.       The method of claim 6, wherein a physical address of a particular section of the user data area adjusted for the existence of the logical zone from a logical address used to logically identify the particular section of the user data area may be determined through the result of the mathematical expression:

5           integer (logical address/user area parameter) x (user area parameter + replacement area parameter) + modulo(logical address/user area parameter) + (offset of user data area).

8.       The method of claim 1, wherein the user area parameter and the replacement area parameter are selectable for optimization of defect management from the group of relationships consisting of:

5           a sum of the user area parameter and the replacement area parameter is approximately a size of the media;

          a sum of twice the user area parameter and the replacement area parameter is approximately a size of the media;

          a sum of the user area parameter and the replacement area parameter is approximately 1/2 a size of the media;

10          a sum of the user area parameter and the replacement area parameter is selected to be small with respect to a size of the media; and

          a sum of the user area parameter and the replacement area parameter is approximately the size of an underlying physical zone.

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~~9. The method of claim 1, wherein the user data replacement area associated with the replacement area parameter is disposed on the media prior to a corresponding user data area associated with the user area parameter.~~

10. The method of claim 1, wherein the user data replacement area associated with the replacement area parameter is disposed on the media subsequent to a corresponding user data area associated with the user area parameter.

11. The method of claim 9, wherein a sum of the user area parameter and the replacement area parameter is selected to be greater than a size of the media to accommodate selection of a desired value of the replacement area parameter.

12. The method of claim 1, further comprising the step of:  
establishing a logical address hierarchy providing logical addressing for physical addresses of sections of the user data area and sections of the user data replacement area, wherein the logical address hierarchy omits physical addresses of sections of data areas determined to be defective, and wherein omission of physical addresses of sections of data areas determined to be defective affects logical addresses of all subsequent sections of data areas on the media.

13. The method of claim 12, wherein the step of establishing a logical address hierarchy comprises the step of:

generating a defect list including information identifying the sections of the data areas determined to be defective and omitted from the logical address hierarchy.

14. The method of claim 12, wherein adjustment of the logical addressing for a particular physical address to omit physical addresses of sections of data areas determined to be defective is accomplished in units equivalent to a single user data area section.

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15. A system for providing media defect management, said system comprising:

means for providing a user area parameter to define a user data area on the media; and

5 means for providing a replacement area parameter to define a user data replacement data area on the media, wherein the user data replacement area on the media defined by the replacement area parameter may be null, and wherein the user area parameter and replacement area parameter are selectable to allow for optimization of defect management for a particular use of the media irrespective of physical attributes of the media.

16. The system of claim 15, further comprising:

means for maintaining a defect list including information identifying each independently accessible section of user replacement data area on the media.

17. The system of claim 16, wherein the defect list maintaining means includes:

5 means for categorizing the independently accessible sections of the user data replacement areas in the defect list to provide information with respect to their use in replacing user data areas of the media.


18. The system of claim 17, wherein the categorizing means includes:

means for providing information with respect to a defective section of the user data area that has not been recorded within a section of the user data replacement area.

19. The system of claim 15, wherein the user area parameter and the replacement area parameter combined define a logical zone such that, if the user area parameter and the replacement area parameter are selected to be sufficiently small with

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5      respect to a total size of the media, a plurality of equal in size zones of user data area and user data replacement area are defined on the media.

*part B4*  20.      The system of claim 15, wherein the user area parameter and the replacement area parameter are selectable for optimization of defect management from the group of relationships consisting of:

10              a sum of the user area parameter and the replacement area parameter is approximately a size of the media;

            a sum of twice the user area parameter and the replacement area parameter is approximately a size of the media;

            a sum of the user area parameter and the replacement area parameter is approximately 1/2 a size of the media;

15              a sum of the user area parameter and the replacement area parameter is selected to be small with respect to a size of the media; and

            a sum of the user area parameter and the replacement area parameter is approximately the size of an underlying physical zone.

21.      The system of claim 15, wherein the user data replacement area associated with the replacement area parameter is disposed on the media prior to the user data area associated with the user area parameter.

22.      The system of claim 15, wherein the user data replacement area associated with the replacement area parameter is disposed on the media subsequent to the user data area associated with the user area parameter.

5      23.      The system of claim 21, wherein a sum of the user area parameter and the replacement area parameter is selected to be greater than a size of the media to accommodate selection of a desired value of the replacement area parameter.



25. An information storage media adapted to provide media data storage area management, the storage media comprising:

5 a primary list including information identifying media data sections initially determined to be unacceptable, wherein a logical address hierarchy which omits physical address information of the media data sections initially determined to be unacceptable is determinable from the primary list, and wherein the logical address hierarchy determined from the primary list is continuously slipped across the media to omit the unacceptable media data sections;

10 a spare interval parameter establishing a number of media data sections associated with a user data area on the media;

15 a spare length parameter establishing a number of media data sections associated with a sparing data area on the media, wherein the number of media data sections established by the spare length parameter may be zero, and wherein the spare interval parameter and the spare length parameter are selectable irrespective of physical attributes of the media;

at least one user data area including the number of media data sections established by the spare interval parameter, wherein the media data sections of the user data area excludes sections identified in the primary list;

20 at least one sparing data area including the number of media data sections established by the length parameter, wherein the media data sections of the sparing data area excludes sections identified in the primary list; and

a secondary list including information identifying each media data section of the sparing data area and providing information with respect to the status of each media data section of the sparing data area.

26. The media of claim 25, wherein the information with respect to the status of media data sections in the secondary list includes information identifying a sparing data area data section associated with a data section of the user data area determined to be defective not yet written to the sparing data area data section.

27. The media of claim 25, wherein the information with respect to the status of media data sections in the secondary list includes information identifying a sparing data area data section determined to be defective and not available for sparing.

28. The media of claim 25, wherein the information with respect to the status of media data sections in the secondary list includes information identifying a sparing data area section associated with the data section of the data area determined to be defective and contains the user's data instead of that user data area.

29. The media of claim 25, wherein the information with respect to the status of media data sections in the secondary list includes information identifying a sparing data area section that is available for use.

30. The media of claim 25, wherein the at least one sparing data area is disposed on the media prior to the at least one user data area.

31. The media of claim 30, wherein the spare interval parameter and the spare length parameter are selected such that their sum is greater than a size of the media.

32. The media of claim 25, wherein the spare interval parameter and the spare length parameter are selected to optimize data access of the media for a preselected media use.

33. The media of claim 32, wherein the preselected media use is streaming video and the spare interval parameter and the spare length parameter are selected such that their sum is approximately a size of the media.

34. The media of claim 32, wherein the preselected media use is processor based system data storage and the spare interval parameter and the spare length



parameter are selected such that a sum of the user area parameter and the replacement area parameter is approximately  $\frac{1}{2}$  a size of the media.

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35. A method for providing media defect management for a block addressable bulk storage media, said method comprising the steps of:

providing a spare interval parameter to establish a number of blocks of a user data area on the media; and

providing a spare length parameter to establish a number of blocks of a user data sparing area on the media, wherein the number of blocks of a user data sparing area established by the spare length parameter may be zero, and wherein the spare interval parameter and spare length parameter are selectable to allow for optimization of defect management for a particular use of the media irrespective of physical zones of the media;

maintaining a list including information identifying each block of the user data sparing area, wherein the list includes information with respect to a status of each block identified.

36. The method of claim 35, wherein the information with respect to a status of each block includes information with respect to a defective block of the user data area that has not been recorded within a block of the user data replacement area.

37. The method of claim 36, further comprising the step of:  
establishing a logical address hierarchy of the blocks of the media wherein physical addresses of blocks initially determined to be defective are not included in the logical address hierarchy, and wherein all logical addresses corresponding to a physical address subsequent to a block initially determined to be defective are adjusted at least an address space of the block initially determined to be defective.

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